EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 07275107
PUBLICATION DATE : 24-10-95

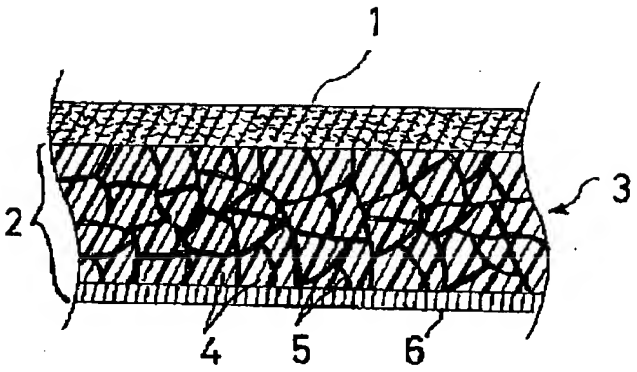
APPLICATION DATE : 04-04-94
APPLICATION NUMBER : 06090639

APPLICANT : INOAC CORP;

INVENTOR : FUKUYAMA MASAHIRO;

INT.CL. : A47G 27/02 B32B 5/24

TITLE : POLYURETHANE LINING MATERIAL FOR CARPET AND ITS PRODUCTION



ABSTRACT : PURPOSE: To provide a polyurethane lining material for carpets which is inexpensive and is excellent in durability, thickness accuracy, etc., by reutilizing a soft polyurethane foam which is industrial waste and a process for producing such lining material.

CONSTITUTION: This polyurethane lining material 2 for carpets consists of a polyurethane elastic material 3 and a non-woven fabric 6 as a reinforcing layer integrally joined to one surface thereof. A carpet fabric 1 is joined to the front surface of this lining material 2, by which the carpet is obtd. The polyurethane elastic material 3 is formed by bonding and solidifying raw materials mainly composed of urethane chips 4 formed by crushing the soft polyurethane foams by a urethane binder 5, then compressing and thermally fixing such solidified matter. The elastic material is so formed that its breaking strength measured by a prescribed measurement method is ≥0.5kg/m and that the thickness accuracy of the lining material 2 is below the prescribed thickness of ±0.5mm.

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-275107
(43)Date of publication of application : 24.10.1995

(51)Int.Cl. A47G 27/02
B32B 5/24

(21)Application number : 06-090639
(22)Date of filing : 04.04.1994

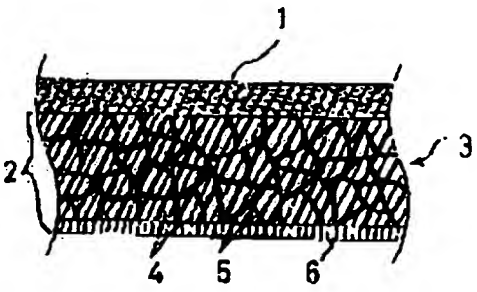
(71)Applicant : INOAC CORP
(72)Inventor : ITO KOJI
FUKUYAMA MASAHIRO

(54) POLYURETHANE LINING MATERIAL FOR CARPET AND ITS PRODUCTION

(57)Abstract:

PURPOSE: To provide a polyurethane lining material for carpets which is inexpensive and is excellent in durability, thickness accuracy, etc., by reutilizing a soft polyurethane foam which is industrial waste and a process for producing such lining material.

CONSTITUTION: This polyurethane lining material 2 for carpets consists of a polyurethane elastic material 3 and a non-woven fabric 6 as a reinforcing layer integrally joined to one surface thereof. A carpet fabric 1 is joined to the front surface of this lining material 2, by which the carpet is obtd. The polyurethane elastic material 3 is formed by bonding and solidifying raw materials mainly composed of urethane chips 4 formed by crushing the soft polyurethane foams by a urethane binder 5, then compressing and thermally fixing such solidified matter. The elastic material is so formed that its breaking strength measured by a prescribed measurement method is ≥0.5kg/m and that the thickness accuracy of the lining material 2 is below the prescribed thickness of ±0.5mm.



LEGAL STATUS

[Date of request for examination] 08.03.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application

converted registration]

[Date of final disposal for application]

[Patent number]	3356873
[Date of registration]	04.10.2002
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the lining material for carpets which consists of a polyurethane system elastic body and reinforcement layers, such as a nonwoven fabric, and its manufacture approach. By joining a carpeting material to the lining material for carpets of this invention, the carpet excellent in endurance, cushioning properties, etc. can be obtained.
[0002]
[Description of the Prior Art] Using what combined with one the chip which consists of flexible polyurethane foam as industrial waste or a scrap with urethane system binding material as lining material of a carpet is already known. For example, soft foam is considered as a chip by crushing etc., the mixture which added extenders, such as fiber waste, to this is combined with one with binding material, it considers as the shape of a sheet, and the lining layer which arranged coats, such as a nonwoven fabric, on the whole surface is indicated by JP,2-1106,Y. A steam is added, reaction hardening of the binding material is carried out, making a coat put on the mixture of a chip and binding material, and compressing the whole into a desired thickness dimension as the manufacture approach, and it is indicated that the lining layer on which the coat was stuck in one is completed. Moreover, as a reaction hardening means of binding material, an ingredient is sprayed in the preceding paragraph story of compression of the water solution which added the catalyst beforehand, and it is explained that reaction hardening can be carried out by heating compression. in addition, how to be alike on the other hand and join [manufactures thick urethane chip combination in shuttering, slices this in necessary thickness, and joins a nonwoven fabric etc. to the whole surface with adhesives, and] a carpeting material is also learned.
[0003] However, with the technique indicated by above-mentioned JP,2-1106,Y, even if it carries out reaction hardening of the binding material with which means, the bonding strength during a chip is not enough and lining ******** obtained becomes that to which endurance was inferior in the carpet. moreover, by the above-mentioned approach, although the urethane chip was made into one with binding material, the front face is a quite coarse field, and its adhesive strength of the coat arranged on the whole surface, and the carpeting material and chip combination which is alike on the other hand and is joined becomes what was [endurance] inferior like [the carpet obtained] the lining layer rather than it is enough. Furthermore, when the variation in thickness becomes a large carpet, for example, it uses as a tile carpet, or it ********** and is inconvenient, although it is the level difference of about 1mm, since the precision of the thickness in the process capability of a slice is at most about **0.7-1.0mm by the approach of slicing the urethane chip combination manufactured in shuttering.
[0004]
[Problem(s) to be Solved by the Invention] This invention solves the above-mentioned trouble, reuses the flexible polyurethane foam used as industrial waste, and it is cheap and it aims at offering the polyurethane system lining material for carpets excellent in endurance, thickness precision, etc., and its manufacture approach.
[0005]
[Means for Solving the Problem] The polyurethane system lining material for carpets of **** 1 invention In the lining material for carpets which consists of a polyurethane system elastic body and a reinforcement layer joined to one by the whole surface the above-mentioned polyurethane system elastic body The raw material which uses as a principal member the urethane chip which comes to crush flexible polyurethane foam The urethane system combination obtained

by carrying out joint solidification with urethane system binding material is pressed. Polyurethane system lining material for carpets which carries out heat setting and is characterized by for the disruptive strength by the following measuring method being 0.5kg / 25mm or more, and the thickness precision of the above-mentioned lining material being **0.5mm or less in predetermined thickness.
Measuring method: Join a carpeting material to the field where the above-mentioned reinforcement layer of the above-mentioned elastic body is not joined on the conditions which do not produce interface destruction and the cohesive failure of adhesives, and carry out the friction test of the above-mentioned lining material and the above-mentioned carpeting material to it using the piece of a trial of 25mm width of face.
It is characterized by for the above-mentioned disruptive strength of the 2nd invention being 1.0kg / 25mm or more again, and the above-mentioned thickness precision 180-degree friction test and speed-of-testing:20cm being **0.3mm or less in predetermined thickness by /.
[0006] The above "flexible polyurethane foam" can use especially the form processed as industrial waste or a scrap without a limit, as long as there is no bad influence in the engine performance as lining material for carpets. Although what kind of thing is sufficient also as the approach of "crushing", and the configuration of the "urethane chip" which especially a limit is not carried out and is obtained by crushing, and it can be used as it is, without usually processing the thing of an indeterminate form in any way the chip of the range the most of whose will be the major axis of about 3-10mm if the bonding strength between uniform distribution of a chip in lining material or the chip by binding material etc. is taken into consideration -- it is -- too much detailed **** -- as for a big and rough chip, what is not included as much as possible is desirable.
[0007] Moreover, the above "urethane system combination" is formed by carrying out joint solidification of the raw material which uses an urethane chip as a principal member with "urethane system binding material." As the above "a raw material", fiber waste etc. can be suitably used together as an extender other than the urethane chip which is a "principal member." If what crushed for example, the used carpet is used as an extender, the waste of synthetic resin, such as a polyvinyl chloride currently used as a backup layer besides fiber waste, will also be mixed, but unless the engine performance of the polyurethane system lining material obtained is reduced, there is especially no problem. Although it is desirable to carry out the rate of things other than the principal member to the raw material whole quantity to to moiety extent, the quantity of binding material can be increased, for example, and the rate can also be increased further. Moreover, a configuration, a dimension, etc. of an extender are the same as that of an urethane chip, and are good.
[0008] Furthermore, what added toluene diisocyanate or diphenylmethane diisocyanate can be used for what mixed diol as the above "urethane system binding material" to the usual urethane undiluted solution, for example, the thing which carried out the polyaddition of a part of toluene diisocyanate to triol, triol, or it. At the time of reaction solidification of this binding material, between an urethane chip and an extender is mutually combined with one, and urethane system combination is formed. Especially limitation is not carried out, but takes into consideration the target thickness of the compressibility in the case of pressing combination, the "polyurethane system elastic body" obtained by pressing and carrying out heat setting, or "polyurethane system lining material", and should just determine the thickness of this combination.
[0009] Although use of the nonwoven fabric which consists of a polypropylene fiber, polyester fiber, etc. is desirable from an economical field as the above "a reinforcement layer", in addition in case textile fabrics, the film made of synthetic resin, etc. can be used and carpets, such as the time of exchange of a carpet, are removed from a floor, the adhesive strength between a carpet and a floor cannot be resisted, but what has the tensile strength of extent which fractures and does not remain in a floor partially, tearing strength, etc. can be used. Moreover, if the permeability between the carpet after dissipation to the exteriors currently used for the adhesives at the time of carpet construction, such as a solvent and moisture, and also construction and a floor etc. is taken into consideration, use of textile fabrics and a nonwoven fabric is more more desirable than a film.
[0010] The manufacture approach of the polyurethane system lining material for carpets **** 3 invention Urethane system binding material is blended with the raw material which uses as a principal member the urethane chip which comes to crush flexible polyurethane foam, and it is filled up with a compound into shuttering after that. Subsequently The raw material which introduces a heating steam into the above-mentioned compound, is made to carry out reaction solidification of the above-mentioned binding material, and uses the above-mentioned urethane chip as a principal member The urethane system combination which it comes to combine with one with the above-mentioned binding

material which carried out reaction solidification is obtained. Then, slice in predetermined thickness and the laminating of the reinforcement layer is carried out to the whole surface of the this sliced urethane system combination. Under the temperature of 150-230 degrees C, the pressure of 0.2-3.0kg/cm2, and the condition beyond time amount 0.5 minute, while pressing the above-mentioned combination in 20 - 70% of thickness of the above-mentioned predetermined thickness, it is characterized by carrying out heat setting.

[0011] While an urethane chip is thrown in in a proper blender and carries out dryblend, for example as an approach of blending urethane system binding material with a raw material, binding material is blown with a spray gun etc. into this, and the approach of fully stirring and mixing both to homogeneity as much as possible etc. is mentioned. In addition, if the urethane chip and the extender are beforehand mixed to homogeneity before supplying to a blender, when using an extender, urethane chip, extender, and binding-material 3 person can be mixed more to homogeneity, and it is desirable. It is filled up with this mixture into shuttering, and a heating steam is introduced, reaction solidification of the binding material is carried out, and urethane system combination is formed.

[0012] The above "pressing" and "heat setting" are made under the above-mentioned predetermined temperature, a pressure, and time amount. When temperature becomes insufficient [less than 150 degrees C / heat setting], the disruptive strength of a polyurethane system elastic body falls and 230 degrees C is exceeded, the heat deterioration of an urethane chip may be produced. A pressure is 0.2kg/cm2. The lining material of uniform predetermined thickness cannot be obtained in the following, but it is 3.0kg/cm2. Even if it exceeds, any effectiveness is not acquired any more, either but it is useless. Moreover, time amount becomes inadequate [heat setting] in less than 0.5 minutes. Less than 5-minute extent is enough as especially this time amount for 10 minutes. In addition, temperature is 160-200 degrees C, and a pressure is 1.0-2.0kg/cm2. And if time amount is the range for 2 - 3 minutes, the polyurethane system lining material of a more excellent thickness precision and disruptive strength is obtained, and it is desirable.

[0013] An elastic body is compressed into 20 - 70% of thickness of the thickness of combination by the above-mentioned process also including the reinforcement layer by which the laminating was carried out to the whole surface, and the lining material of this invention is formed of it. Thickness precision and disruptive strength with this compressibility sufficient at less than 20% are not obtained, but when it presses exceeding 70%, lining material becomes hard too much, and the cushioning properties of the carpet obtained etc. fall. About 40 - 60% of especially this compressibility is desirable, and the lining material or carpet of the engine performance which was excellent when it was this range is obtained. Moreover, the thickness of the lining material obtained has the especially desirable range of 3-6mm 2-10mm, if physical properties, such as a degree of hardness of an elastic body and elasticity, the engine performance as a carpet, for example, heat insulation heat retaining property, and floor impact sound cutoff nature, a feeling with a bottom, etc. are taken into consideration. Furthermore, in this invention, even if the thickness of lining material is 10mm and a thick case, it can consider as the lining material of a high thickness precision according to claim 1 or 2.

[0014]

[Example] Hereafter, a drawing is also used and the example of this invention is explained concretely.

110kg of chips 4 with which example 1 major axis consists of flexible polyurethane foam crushed by the magnitude which is about 3-10mm was prepared. Apart from this, the polyaddition of the toluene diisocyanate was carried out to the polypropylene glycol for elasticity urethane foaming of molecular weight 2500-3500, and 15kg of urethane system binding material 5 (the binding material which exists in urethane system combination uses the number same for convenience, although this carries out reaction solidification.) suitably diluted and obtained 3 times with the solvent was prepared. Then, supplying and carrying out the dryblend of the whole quantity of the above-mentioned chip 4 to a blender, with the spray gun, the above-mentioned binding material 5 was blown into the chip 4 whole as spreading round homogeneity as much as possible, and was stirred enough. subsequently, this stirring mixture -- an inside dimension method -- length -- the side -- it was filled up into 1m each and metal shuttering with a depth of 80cm. Then, the heating steam was introduced into this shuttering, reaction solidification of the binding material 5 was carried out, and urethane system combination was obtained.

[0015] The combination obtained as mentioned above is sliced with a thickness of 8mm in the shape of a sheet. the nonwoven fabric 6 (the Toray Industries [, Inc.], Inc. make --) which becomes the whole surface from black polyester fiber Trade-name "bitter-taste Star" Metsuke-amount: The laminating of 30 g/m2 is carried out, and this layered product is inserted between the hot platens set as 180 degrees C of a compacting machine, is pressurized, narrow between hot platens gradually, fix the gap between hot platens to 4mm, and it is the pressure of 1.5kg/cm2. It pressed for 2.5 minutes

and heat setting was carried out. Then, it cooled even to the room temperature, inserting and pressurizing between hot platens, and the carpeting material 1 was pasted up on the field where the nonwoven fabric 6 of the polyurethane system lining material 2 which consists of an obtained polyurethane system elastic body 3 and a nonwoven fabric 6 is not joined with urethane system adhesives (the product made from INOAKKU, Inc., trade name "135KTS"), and the carpet which consists of lining material and a carpeting material was obtained.

[0016] It replaced with chip 110kg which consists of example 2 flexible polyurethane foam, and chip 50kg (20kg of fiber waste, 30kg of polyvinyl chloride waste which is back-up material) which consists of a used carpet crushed by the same configuration as this chip 60kg and magnitude was used, the quantity of urethane system binding material was increased to 20kg, and also lining material and a carpet were obtained like the example 1.

without it slices and carries out heat setting of the sheet of 4mm thickness from the urethane system combination which is the intermediate product of example of comparison 1 example 1 -- urethane system adhesives -- the whole surface -- a nonwoven fabric -- on the other hand, it was alike, the carpeting material was joined, and the carpet was obtained.

[0017] The thickness precision of the lining material obtained in examples 1-2 and the example 1 of a comparison, the consistency of a polyurethane system elastic body, and disruptive strength were measured (although it was considering as the friction test as a measuring method by the friction test of a carpeting material and lining material in addition since not the cohesive failure of interfacial peeling between an adherend and adhesives and the adhesives itself but destruction of an elastic body was produced, as physical properties, it considered as disruptive strength.). Each test method is as follows.

Thickness precision: It measured in my good meter.

Consistency: Measure the weight (kg) of an one-side a 10cm cube, and express with the numeric value which **(ed) weight by the volume.

Disruptive strength: The above result is shown in Table 1 by 180-degree friction test, trial one-sided width;25mm, and speed-of-testing;20cm/.

[0018]

[Table 1]

表 1

	実施例1	実施例2	比較例1
ｸｯｼｮﾝ 層厚さ (mm)	4	4	4
厚み精度 (mm)	4±0.2	4±0.2	4±0.8
密度 (kg/l)	0.25	0.30	0.13
破壊強度 (kg／25mm幅)	1.2	1.8	0.5

[0019] According to the result of Table 1, the whole surface can be made into the smooth field which does not have a level difference mostly, even if the consistency of each example which carried out pressing and heat setting is rising greatly compared with the consistency of the example of a comparison which has not carried out heat setting, and the thickness precision of lining material is 4 times the high precision of the example of a comparison in each example and it carries out usage like a tile carpet. Moreover, compared with the example of a comparison, in the example 1, it becomes more than twice, it has become 3 or more times in the example 2, and, as for the disruptive strength of an elastic body, it turns out that the lining material of this invention has big reinforcement. In addition, in this invention, it is not restricted to what is shown in said concrete example, but can consider as the example variously changed within the limits of this invention according to the purpose and the application.

[0020]

[Effect of the Invention] In **** 1 invention, even the soft foam or the waste carpet processed as industrial waste or a scrap uses it as the raw material, and the lining material for carpets is obtained. Therefore, it also becomes an aid of a

waste treatment problem solving, and cheap lining material or a cheap carpet can be obtained. Moreover, the carpet with which it is improving greatly, and the thickness precision is conventionally acquired compared with elegance since disruptive strength is very large becomes the thing excellent in endurance, cushioning properties, etc. Moreover, the lining material of the 2nd invention has further excellent thickness precision and disruptive strength. Furthermore, the lining material of the engine performance which excelled [invention / 3rd] in the 1st and 2 invention by the simple production process which adds the process which carries out heat setting by pressing a polyurethane system elastic body to the production process of the conventional lining material using a compacting machine etc. can be manufactured.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] In the lining material for carpets which consists of a polyurethane system elastic body and a reinforcement layer joined to one by the whole surface the above-mentioned polyurethane system elastic body The raw material which uses as a principal member the urethane chip which comes to crush flexible polyurethane foam The urethane system combination obtained by carrying out joint solidification with urethane system binding material is pressed. Polyurethane system lining material for carpets which carries out heat setting and is characterized by for the disruptive strength by the following measuring method being 0.5kg / 25mm or more, and the thickness precision of the above-mentioned lining material being **0.5mm or less in predetermined thickness.
Measuring method: Join a carpeting material to the field where the above-mentioned reinforcement layer of the above-mentioned elastic body is not joined on the conditions which do not produce interface destruction and the cohesive failure of adhesives, and carry out the friction test of the above-mentioned lining material and the above-mentioned carpeting material to it using the piece of a trial of 25mm width of face.
It is [Claim 2] by 180-degree friction test and speed-of-testing:20cm/. Polyurethane system lining material for carpets according to claim 1 whose above-mentioned disruptive strength is 1.0kg / 25mm or more and whose above-mentioned thickness precision is **0.3mm or less in predetermined thickness.
[Claim 3] Urethane system binding material is blended with the raw material which uses as a principal member the urethane chip which comes to crush flexible polyurethane foam, and it is filled up with a compound into shuttering after that. Subsequently The raw material which introduces a heating steam into the above-mentioned compound, is made to carry out reaction solidification of the above-mentioned binding material, and uses the above-mentioned urethane chip as a principal member The urethane system combination which it comes to combine with one with the above-mentioned binding material which carried out reaction solidification is obtained. Then, slice in predetermined thickness and the laminating of the reinforcement layer is carried out to the whole surface of the this sliced urethane system combination. The manufacture approach of the polyurethane system lining material for carpets characterized by carrying out heat setting while pressing the above-mentioned combination in 20 - 70% of thickness of the above-mentioned predetermined thickness under the temperature of 150-230 degrees C, the pressure of 0.2-3.0kg/cm2, and the condition beyond time amount 0.5 minute.

[Translation done.]